Claims

1. A pulse width modulation driving apparatus for a light emitting diode, comprising:

a sawtooth wave generator for generating a sawtooth wave signal;

a comparator;

a field effect transistor (FET) having a gate terminal, a source terminal and a drain terminal;

a power supply;

a first current limiting resistor and a second current limiting resistor; and

at least one light emitting diode serving as a load;

wherein a modulation signal and the sawtooth wave signal are input to the comparator, an output of the comparator is connected to a gate terminal of the FET, the first resistor is connected between the power supply and a source terminal of the FET, and a drain terminal of the FET outputs a driving current through the second resistor to the load.

2. The pulse width modulation driving apparatus as described in claim 1, wherein the FET is an N-channel enhancement-type FET.

3. The pulse width modulation driving apparatus as described in claim 1, wherein the FET is a P-channel enhancement-type FET.

4. The pulse width modulation driving apparatus as described in claim 1, wherein the FET is an N-channel depletion-type FET.

5. The pulse width modulation driving apparatus as described in claim 1, wherein the FET is a P-channel depletion-type FET.

6. A pulse width modulation driving apparatus assembly comprising:

a field effect transistor (EFT) defining a gate terminal, a source terminal and a drain terminal;

a light emitting diode (LED) array electrically connected to the drain terminal;

a modulation signal source; and

means respectively connected to said gate terminal and said source terminal for providing an equivalent driving current, on the drain terminal, which is proportional to amplitude of signal derived from the modulation signal source.

7. The pulse width modulation driving apparatus assembly as described in claim 6, wherein said means includes a power supply and a current limiting resistor connected to the source terminal.

8. The pulse width modulation driving apparatus assembly as described in claim 6, wherein said means includes a comparator connected to the gate terminal, a wave generator and said modulation signal source.

9. The pulse width modulation driving apparatus assembly as described in claim 6, wherein said wave generator is a sawtooth wave generator.

10. A method of providing a light emitting diode (LED) array with a linearly adjusted driving current, comprising steps of:

providing a field effect transistor (EFT) defining a gate terminal, a source terminal and a drain terminal;

electrically connecting a light emitting diode (LED) array electrically to the drain terminal;

electrically connecting a modulation signal source to the gate terminal; and

electrically connecting a power supply to the source terminal; wherein

a driving current provided on the drain terminal for activating said LED array is changed linearly corresponding to a linear change of signals generated from the modulation signal source.

11. The method as described in claim 10, wherein a comparator with an associated wave generator is mechanically and electrically connected between the gate terminal and said modulation signal source.

12. The method as described in claim 10, wherein a current limiting resistor is provided between the source terminal and the power supply.

13. The method as described in claim 10, wherein a current limiting resistor is provided between the drain terminal and the LED array.